

ABSTRACT

Introduction: In the quest for effective and efficient tooth movement efficiency innumerable materials in orthodontics were developed intended at optimizing patient comfort and reducing treatment time. Pursuit for finding various modalities to reduce friction at bracket archwire interface has brought in two more types of elastomeric ligatures namely Slide ligatures (Leone, Sesto Fiorentino) and super Slick ligatures (TP Orthodontics, laporte, Ind). . Since information regarding friction during retraction stages are not yet clearly reported in the previous scanty studies, this study was undertaken to assess whether there is reduction in frictional resistance while using these non-conventional elastomeric modules when compared to conventional elastomeric modules, during retraction and space closure stages.

Aim and Objectives: To evaluate the clinical efficiency of nonconventional new generation elastomeric ligatures – (Slide, Leone Orthodontic products, Italy) & Super Slick Ties (SSTTM) during individual canine retraction phase of PEA therapy by comparing canine retraction rate, canine and molar rotation and anchorage loss.

Materials and Methods: The study included 30 Class I bialveolar protrusion patients between the age group of 14-24 years requiring extraction of all first premolars. The sample was randomly divided into three groups: the study groups-{slide ligature group (A), Super slick ligatures (B)} and the control group (group C-conventional). Split mouth design was used in which one side of the mouth was ligated using nonconventional ligature modules and other side using conventional modules and side were chosen randomly. Canine retraction was done using closed close coil spring. Study models were recorded were taken at the end of alignment (T0) and continued at the end of every month for 5months or until completion of

canine retraction whichever is earlier. Rate of canine retraction, Anchor loss, Amount of canine and molar rotation in each quadrant were estimated from the study models. The data obtained from this study was evaluated and comparisons were made within the group and between the study group and the control group. Means, standard deviations, and level of significance were determined. One way ANOVA was to compare difference between 3 groups. Student t test was done to find the significance of study parameters within 2 groups

Results: In maxilla the mean rate of canine retraction on Group A , group B and group C was 1.674 ± 0.092 , 1.187 ± 0.156 and 1.147 ± 0.113 respectively .[The difference in the rate of retraction was statistically significant , ie, $p < 0.0001$. In mandible the mean rate of canine retraction on Group A , group B and group C was 1.765 ± 0.099 , 1.300 ± 0.099 and 1.270 ± 0.111 respectively . The difference in the rate of retraction was statistically significant, ie, $p < 0.0001$. In maxilla the group A had a mean anchorage loss of 1.054mm , while group B had a mean anchorage loss of 1. The group C had a mean anchorage loss of 1.715mm ± 0.163 . In mandible, The mean anchorage loss of mandibular first molar was 1.024mm, 0.952mm and 1.664mm with a standard deviation of ± 0.113 , ± 0.083 and ± 0.111 in Group A,B and C respectively. Group A had a mean canine rotation of $8.55^0 \pm 1.506$ in maxilla and $8.93^0 \pm 1.474$ in mandible. Mean canine rotation for group B was $5.30^0 \pm 1.386$ in maxilla and $5.83^0 \pm 1.096$ in mandible. Group C had a mean canine rotation of $6.10^0 \pm 1.315$ in maxilla and $6.88^0 \pm 1.813$ in mandible. Mean molar rotation rate in maxilla was $2.58^0 \pm 0.735$, $2.21^0 \pm 0.549$ and $2.21^0 \pm 0.700$ for group A, group B and group C respectively while Mean molar rotation rate in mandible was $2.90^0 \pm 0.541$, $2.65^0 \pm 0.639$ and $2.78^0 \pm 0.604$ in group A, group B and group C respectively

Conclusion: The rate of canine retraction was more with Slide ligature module than with conventional module and super slick ligature in the given study period and method. Mean anchor loss was lesser when non-conventional modules were used. Mean Rotation of the canines during retraction was least in super slick ligature mode and was more in Slide ligature, which was the only disadvantage of Slide ligature.. Molar rotations were evident for all the groups however; there was no significant difference between them.

Keywords: non-conventional elastomeric modules, Slide ligatures, super Slick ligatures, canine retraction